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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/715,322

11/14/2003

Brian A. Hamman

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7590

08/28/2006

PATENT DOMININ LP  
555 REPUBLIC DRIVE  
SUITE 200  
PLANO, TX 75074

EXAMINER

VORTMAN, ANATOLY

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/715,322	<b>Applicant(s)</b> HAMMAN, BRIAN A.	
	<b>Examiner</b> Anatoly Vortman	<b>Art Unit</b> 2835	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 46-62 is/are pending in the application.  
     4a) Of the above claim(s) 53 and 54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 46-52 and 55-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Applicant's Reply***

1. The submission of the Reply of July 3, 2006 to the Non-Final Office action of April 13, 2006 is hereby acknowledged. The Office action follows:

### ***Election/Restrictions***

2. Claims 53 and 54, as amended, do not read on the elected Specie II and recite features pertained to the non-elected Specie III, since claim 53 recites: "N heat transfer units" (i.e. a plurality of the heat transfer units) as shown on Fig. 9 (see Restriction / Election Requirement of August 25, 2005). If Applicant elects a particular invention with specific features and concurrently amends / adds claims, the new or amended claims must include all of the features and be strictly within the scope of the elected claims. In the instant situation amended claims 53 and 54 read on the non-elected Specie III as explained above, and therefore, are withdrawn from further consideration as drawn to a non-elected invention.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 46, 52, and 58-62, are rejected under 35 U.S.C. 102(b) as being anticipated by US/6,234,240 to Cheon.

Regarding claims 46 and 58-61, Cheon disclosed (Fig. 2,3) a liquid cooling system for an electronic system, comprising: a heat transfer unit (14, 22) operating under the peltier effect, the heat transfer unit including a cold region (18) and a hot region (16), wherein the cold region (18) is thermally coupled to one or more heat generating components (10) and absorbs heat from the heat generating component (10) for transfer to the hot region (16), a conduit (56, 58) coupled to the hot region (16) and dissipating heat by transporting cooled liquid (C), the cooled liquid transforming into heated liquid in response to receiving the heat from the hot region (16) and a heat exchange unit (34, 44) coupled to the conduit (56, 58) and receiving the heated liquid: the heat exchange unit generating the cooled liquid in response to receiving the heated liquid.

Regarding claim 52, Cheon disclosed (Fig. 2,3) that said heat transfer unit (14, 22) further comprises: an inlet coupled to the conduit (58) for receiving the cooled liquid from the heat exchange unit (34, 44); an outlet coupled to the conduit (56) for receiving heated liquid from the conduit and directing the heated liquid to the heat exchange unit (34, 44); and wherein the inlet is disposed below the outlet (Fig. 3) for enhancing convective flow of the liquid (inherently).

Regarding claim 62, the method steps recited in the claim are inherently necessitated by the device structure as taught by Cheon.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 47-51 and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Law et al., (Law).

Regarding claims 47-51, Chen disclosed all, but the first and second electron conducting materials operating under peltier effect, each having the first and second cold and hot regions, respectively, said electron conducting materials are connected at a junction for mating with the processor, wherein, said first and second cold regions are disposed in close proximity to each other, thus forming cold region for thermal coupling to the heat generating component(s), and said first and second hot regions are also disposed in close proximity to each other, thus forming a hot region for thermal coupling to the conduit.

Law disclosed (Fig. 1, 3, 9) a cooling arrangement comprising: the first and second electron conducting materials (any two of four materials corresponding to regions (904, 906, 908, 910)) operating under peltier effect (i.e. thermocouples, column 10, lines 35-40) and connected at a junction (Fig. 9) for mating with a processor (901), each said heat conducting materials (904, 906, 908, 910) having the first and second cold regions, respectively, and the first and second hot regions, respectively (like in Fig. 3), and, wherein, said first and second cold regions are disposed in close proximity to each other, thus forming cold region for thermal coupling to the heat generating component (901), and said first and second hot regions are also

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disposed in close proximity to each other, thus forming a hot region for thermal coupling to a heat sink (318) (column 10, lines 23-51).

Since inventions of Chen and Law are from the same field of endeavor (cooling systems utilizing peltier devices), the purpose of using a plurality of peltier electron conducting materials taught by Law would be recognized in the cooling system of Chen.

It would have been obvious to a person of ordinary skill in the cooling art at the time the invention was made to substitute the peltier electron conducting material (14) of Chen with a plurality of peltier electron conducting materials of Law, in order to provide appropriate cooling for different regions of the processor (see Law, column 10, lines 41-51).

Regarding claims 55-57, Law further teaches (Fig. 1 and 2) that the peltier electron conducting materials (108, 208, 210) are semiconductor solid state peltier-effect devices (column 4, lines 22-25 and column 5, lines 34-48), wherein the cold region and the hot region of the peltier-effect device are parts of the electron conducting materials (204, 212, 214) coupled to a power source (220) and embedded in a substrate of the semiconductor material (208, 210) (materials (212) and (214) constitute a substrate of the semiconductor materials (208, 210), as shown on Fig. 2).

### ***Response to Arguments***

7. Applicant's arguments have been fully considered but they are not persuasive. Applicant states that: "The Examiner has attempted to define Cheon's heat transfer unit as the combination of a standard liquid cooled heat transfer device (22) and a Peltier thermoelectric cooler (14). No

where in Cheon is it stated or implied that the heat transfer device (22) is or can be eliminated”.

This is not persuasive. It is not clear why Applicant has assumed that Examiner has suggested that the heat transfer device (22) should be eliminated? Examiner had never suggested that. What Examiner has done is interpreted the heat transfer unit of Cheon as comprising two components: (14) and (22), which is absolutely legitimate approach. Cheon’s unit (14, 22) is transferring heat from the electronic device (10) to the conduits (56, 58) and, therefore, is a heat transfer unit. Further, Applicant contends the Examiner’s interpretation of the conduits (56, 58) as being coupled to the hot region (16). This is not persuasive as well. Conduits (56, 58) of Cheon are coupled mechanically and thermally to the hot region (16) via member (22). If they were not, then they would not be able to accept heat from said hot region (16), which is clearly not the case. They (conduits) do accept heat from said hot region (16) and transfer said heat to the cooling liquid (C) and further along the cooling loop to the heat exchange unit (34, 44). Thus, said conduits (56, 58) are coupled (mechanically and thermally) to said hot region (16). Further, Applicant contends that: “Cheon depicts the electron flow of the Peltier thermoelectric cooler (14) between the hot region (16) and the cold region (18) as traversing the smallest dimension (i.e. the thickness) of Peltier thermoelectric cooler (14) as opposed to along the length or width of the electron conducting material as taught in Applicant's invention. Consequently, Applicant submits that this is a further basis for its argument that Cheon does not anticipate Applicant's invention as claimed”. Examiner would like to direct the Applicant’s attention to the fact that claims of the instant application do not specify the route of the electron flow within the electron conducting material. The claims are broader than argued. Further, regarding claim 52, Applicant contends that “in Fig. 3 of Cheon, the inlet to heat transfer device (22) and the outlet to heat

transfer device (22) are essentially shown at the same height and not with the inlet below the outlet". This is not the case. On the contrary, Fig. 3 clearly shows the inlet (i.e. the point of the interconnection between said conduit (58) and member (22)) as being located on the side wall of said member (22), wherein the outlet (i.e. point of the interconnection between said conduit (56) and member (22)) as being located on the top wall of said member (22), which is clearly above said inlet. Thus, convection cooling (circulation) will inherently be taking place, due to the height differential between said inlet and outlet. Further, Applicant has based his arguments on Fig. 6, which is a schematic representation of the top view of the device and cannot be relied upon for judging about the relative disposition of said inlet and outlet.

Furthermore, regarding 35 USC 103 rejection, Applicant contends that Cheon and Law are not from the same field of endeavor, because, allegedly, "[A]t column 4, lines 34-63 of Law, a brief mention is made of converting the heat sink into what those skilled in the art call a heat pipe". Examiner would like to clarify, that Law clearly and explicitly teaches that: "Another suitable exemplary system is a liquid cooling system in which a coolant (e.g., water, oil, and the like) is moves through an interior of the heat sink 110 (e.g., via heat pipes). The coolant absorbs thermal energy from the heat sink which is subsequently dissipated. An evaporator and condenser can be utilized to move the coolant." (Law, column 4, lines 58-63). Thus, Law clearly teaches a liquid cooling system. Further, Examiner has stated that Cheon and Law are from the same field of endeavor, because both teach cooling systems utilizing peltier devices, not because they teach the same liquid cooling systems. It is not even critical for the combined references to teach exactly the same cooling systems. What is important it what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209



(CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA) 1969. In this case, what is important, is that the disclosure of Law (i.e. the idea of using a plurality of the heat transfer materials) would have suggested to a person of ordinary skill in the cooling art at the time the invention was made to use analogous approach for modification of the device of Cheon in order to provide appropriate cooling for different regions of the processor (see Law, column 10, lines 41-51).

Thus, in view of the above, all outstanding rejections of the claims are believed to be appropriate, and hereby maintained.

### *Conclusion*

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AV

A handwritten signature in black ink, appearing to read 'A. Vortman', with a long horizontal flourish extending to the right.

Anatoly Vortman  
Primary Examiner  
Art Unit 2835